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ABSTRACT

This investigation of the relationship between elementary school students and a videodisc system in an educational environment used a social interaction analysis paradigm to identify meaningful patterns of social behavior and to examine whether: (1) such patterns indicate acceptance of or resistance to the technology; (2) students exhibit more active or passive behavior; (3) students perceive the system to be friendly, intelligent, or able to carry on a conversation or dialog; and (4) behavior patterns are gender specific or would have implications for curriculum development utilizing videodisc technology. A triangulated research design included observation, student interviews, and a survey of the students' parents and teachers. Subjects were 17 girls and 22 boys in two fourth-grade classes. Preliminary results of research in progress indicate no apparent gender differences in attitudes and perceptions of videodisc systems. Most students were comfortable working with the videodisc system and found it to be friendly, smart, or intelligent. Thirty-five references are listed. (LMM)

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SOCIAL INTERACTION ANALYSIS of an ELEMENTARY SCHOOL STUDENT and a VIDEODISC SYSTEM in an EDUCATIONAL ENVIRONMENT: A PROGRESS REPORT

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BACKGROUND TO THE PROBLEM

Examination of life in the classroom centers around myriad aspects that surface in the educational environment. Most often educational research focuses upon strategies and stimuli designed to produce a particular type of performance outcome. Research instruments are usually designed in behavioral form and interpreted through quantifiable and measurable objectives. The picture is usually completed through the use of various psychological aptitude and achievement tests that illustrate the effectiveness of the particular strategy or stimulus.

While certain aspects of the classroom may be captured by this psychological model, others are not. Research of this kind looks at education in a vacuum, and concentrates on the individual and individual behaviors. Occassionally there is an exploration of mental processing, as in cognitive psychology. Relationships are reduced to a set of stimuli and responses, or hypotheses and feedback. Social interaction analysis, instead of limiting its investigation to interpretation of the results from some predetermined superimposed structure, attempts to investigate the meaningful patterns and rules of usage in social behavior by examining it in its situational context.

The emergence of new technologies in the classroom setting is nearly always met with the former model of research. Various media, whether print, photography, film, television, audio, video, or computer are investigated to determine their psychological impact.

Sometimes the particular attributes of a medium are assessed to identify which ones might best deliver certain kinds of messages to certain kinds of learners doing certain kinds of tasks (Salomon,1979). Again, this is an application of a particular structure, some medium or medium attribute, used as a stimulus, to provoke some form of response. Results from this kind of experimentation yield quantitative conclusions that can be used to predict similar outcomes in similar situations. However, such situations rarely exist. In this model the setting is controlled; the individual (subject) being examined is considered neutral and without intentions, and the relationship among existing variables, the social interaction, is ignored.

Few children come to thes classroom today without some form of social relationship with the media. Educators need only listen to the conversations among students on the playground, in the halls, or at lunch, to recognize tht such a relationship exists. Research that ignores the intentions of such individuals when they interact with media in an educational setting presents a subtle form of distortion. Research that allows the individual (participant) the opportunity to give an account of her/his relationship, and describes the setting in which the interaction takes place, attempts to eliminate this form of distortion.

Media, and their accompanying technologies, have evolved from ink on paper to light upon a chemical emulsion to electronic signals upon a screen. The last, electronic technology, has allowed the combining of a visual medium, video, with a computational medium, computer, to

form a hybrid known as "interactive video." In order to further accomodate this new medium certain technological developments have and continue to occur. One development of interest to researchers in educational technology is the videodisc. This software and accompanying devices used in its operation are considered to have a dynamic quality that does not exist with video tape. From a simple physical examination this would seem apparent. Tape is linear, and to get from one point in its presentation to another all the tape in between must pass by the electromagnetic head which then reads the information desired. For this reason, most material produced for videotape is sequential or linear in form. On the other hand, a videodisc is made up of concentric circles, and to get from one point in its presentation to another a laser beam moves angularly across one of the radii of the disc. This provides the opportunity to produce material that is not sequential or linear, but randomly accessible and dynamic in form. (Bennion and Schneider, 1975; Love, 1979; Kemph, 1981; Onosko, 1982).

Instructional media research has focused on the application of this medium in the role of individualized instruction. Bunderson (1979-1980) acknowledges that videodisc technology combines two traditions: the artistic tradition of motion pictures and video, and the analytic and empirical tradition of programmed and self-paced instruction. Representative of the predominate view, Bunderson assigns strong motivational features to the former, and instructional facilities to the latter. The use of behavioral analysis, which breaks the program into stimulus-response steps for the learner to

follow is considered to produce "more relevant behaviors." The use of critical analysis, coming from the artistic tradition, or critical viewing skills used to interpret information presented, is not even considered in this discussion of instructional methodology.

Elsewhere, Bunderson (1981) states the need to merge the three traditions to achieve the most effective ISD (Instructional Systems Development) model. Again, the artistic tradition, exemplified by motion picture sequences, is seen as being "limited in the cognitive instructional content" area. Bunderson argues that these sequences require most of the information be carried in the audio track, since visual presentations require "slowpacing" to be effective. In contrast, Arnheim (1969) views all thinking as a product of perception and visual imagery. In this argument, mental images, which include pictures, symbols, and signs, are seen as a precursor to thought.

In their discussion of systems employing videodisc technology, Allen and Allen (1983) stated that successful users expand traditional behaviorist and criterion-referenced models to include focused discovery, cognitive and affective domains, and Social Learning Theory with its awareness of interactions among behavior, cognition and environment. This statement coincides with Molnar's (1979-1980) observation that current instructional paradigms are inadequate for new technology and innovation.

In discussing an "interactive" medium, it is important to realize that interactions are not always explained by an S-R or cognitive model. Pressing buttons in response to visual stimuli do not constitute the entire set of interactions between a student and a

videodisc system in an educational setting. Many interactions result from the cultural context of the classroom. Meaningful patterns of social behavior, and the rules of usage governing relationships, and interactions emerge from the situational context.

While behaviorist, cognitive and other psychological paradigms may permit the formation of models in which students respond or process certain stimuli, they are unable to explain the dynamics of social interaction. This limitation of these paradigms makes it difficult, if not impossible, to adequately research "interactive video." Therefore, in order to properly conduct this study of interactivity, it is necessary to reach beyond the parameters of current educational research paradigms. This study utilizes the social interaction analysis paradigm to discover the relationship between elementary school students and a videodisc system in an educational environment.

STATEMENT OF THE PROBLEM

The purpose of this study is to observe the relationship between elementary school students and a videodisc system in an educational environment. Rather than examining the developmental effectiveness this "interactive" medium has upon students, the study explores the larger question of what kinds of interactions are exhibited when students and videodisc technology are brought together in an educational setting. This investigation is aimed at disclosing meaningful patterns (Blurton Jones and Woodson, 1979) of social behavior that develop through the observable features of the

preceding, contemporary and subsequent behaviors of students and the medium in such a setting. Through comprehensive analysis of these patterns this study provides information that will permit the effective implementation of curricula that bring together elementary school students and videodisc technology in an educational environment.

In order to examine the full range of phenomena that develop when a videodisc system and elementary students coexist in an educational setting, a social interaction theoretical framework is used to direct this research. This paradigm permits the observer to examine the intentions of the students, the impact of the environment, and other non-quantifiable information that may be pertinent to the development of a comprehensive analysis.

STUDY GOALS AND OBJECTIVES

1) What kinds of meaningful patterns emerge through the observation of social behaviors that occur between an elementary school student and a videodisc system in an educational environment?
2) During the course of the interaction between the elementary school student and the videodisc are these meaningful patterns more often examples of acceptance or resistance?
3) During the course of the interaction do elementary school students exhibit more active or passive behavior when interacting with a videodisc system in an educational environment?
4) Do elementary school students that have interacted with a videodisc system in an educational environment perceive the system to be "friendly," "intelligent," or able to carry on a "conversation" or

"dialog?"

5) Are any meaningful patterns of social interaction between elementary school students and a videodisc system in an educational environment gender specific?

6) What implications would these meaningful patterns have for curriculum development which includes the utilization of videodisc technology?

7) What implications for further research may be derived from this study?

ASSUMPTIONS

Educational environments provide an arena for both the cognitive development and social interaction of their inhabitants. While the relationship between instructional events and the students' cognitive ability mediate what is learned, there is a tendency on the part of educational research to focus on mental events. Elementary school classrooms and media centers are communal settings in which students evolve from a collection of individuals into "working social groups" (Amarel, 1983). The social interaction of students with each other and with the environment is a determinant of educational productivity.

Survival requires that in a social context individuals be able to behave both cooperatively and competitively. Evidence of both cooperative and competitive context have been found in research of educational environments (Slavin, 1983; Johnson and Johnson, 1975; Vereen, 1983). In most educational situations the cooperative context or behavior exhibiting acceptance is more desirable and condusive to

learning.

Children have experiences that lead to the formulation of concepts, attitudes, and opinions long before their first school experience. Many of these early experiences, along with many others outside of school, influence the perceptions and expectations of a child. Some of these undoubtedly influence their behavior in school. Experiences outside of school influence students' intentions toward, as well as their expectations and perceptions of, the educational environment.

DEFINITIONS of KEY TERMS and SYMBOLS

Videodisc system: A system of a videodisc player, color monitor, and a videodisc. In some instances, a microcomputer, interface device, computer software, and additional monitors are included. In this study, a level one (Kemph, 1981; Onosko, 1982) or manual (Bunderson, 1979-1980) videodisc player, a videodisc with a program specifically designed for this medium, and a color monitor are used.

"Interactive video": An electronic medium that incorporates still, motion, and text in the visual track, and synchronized and non-synchronized sound on two separate audio tracks. User choice is inherent in the medium and is administered through control over the pace and sequence of the presentation (Bunderson, Hoekema, Hon, Wilson, Worcester, and Woodward, 1983). Features that facilitate

this behavior include fast random access, freeze frame, forward and reverse, slow, fast, step, and "real time" motion, and mono or dual audio selection.

Levels of interaction: Capabilities of videodisc systems are refered to as levels of interaction (Bunderson, 1979-80; Kempt, 1981; Onosko, 1982).

Level One refers to a "manual" commercial optical videodisc player capable of a mixture of still and motion sequences, and which permits the user to select portions and control the pace of the presentation.

Level Two refers to an educational/industrial optical videodisc player capable of automatically branching users to parts of the presentation for review, reinforcement, etc. Some simple forms of scorekeeping are also possible by programming the player's microprocessor.

Level Three refers to an educational/industrial optical videodisc player interfaced with a microcomputer capable of generating graphics and text, editing questions, and keeping detailed records. The microcomputer program can guide the entire presentation and evaluate all responses.

Social interaction: The interrelationship of a set of overt behaviors, verbal and non-verbal, of an individual(s) in a social environment.

Educational environment: The total set of circumstances surrounding an instructional event. In this study, the total set of circumstances includes the physical and social dimensions wherein an instructional event occurs. The physical dimension is referred to as the videodisc system and the classroom, instructional media center, or laboratory setting. The social dimension is referred to as and inclusive of all

events in the instructional context (adapted from Vereen, 1983).

SSR (Senders, Signals, and Receivers) System: An empirically derived method for catergorically recording observations of complex social interactions. The method includes keyboard entry and computer transcription of grammatically structured strings of characters that are used as codes to describe the observations. The defining properties of the codes reduce redundancy in the entries and direct the flow of Program PLEXYN (Stephenson, Smith, and Roberts, 1975; Stephenson, 1979).

PLEXYN: A computer-compatible grammar processing program that verifies, completes and reformats SSR system code into a record for subsequent data analysis.

DELIMITATIONS of the STUDY

This study is limited to upper elementary school students. The sample is drawn from a middle sized urban community in the Midwest. The socioeconomic status and ethnic background of the sample is diverse, but consists primarily of white middle class students. No attempt has been made to randomize the sample, therefore, the results of ths study are not generalizable beyond this or similarily constituted populations.

Analysis of social behavior is limited to an educational environment, and does not attempt to answer questions regarding videodisc systems in training or entertainment. Any implications that may be found in this study as regard these areas would require further research.

THE REVIEW OF RELATED LITERATURE

The review of literature in this chapter is comprised of both theoretical and empirical research related to this study. The review consists of literature from videodisc research and a chronicle of the historical developments leading to its use in education; educational paradigms currently used in the research of videodisc and other innovative technologies; theoretical and methodological issues in social interaction analysis; and, research on the observation of children.

VIDEODISC SYSTEMS: HYPE or HOPE?

> The promises of video disc hark back to those days in the late 19th century when man first perfected a reliable means of mechanically reproducing sound. The Americans Alexander Graham Bell and Thomas Edison, the Frenchman Charles Clos, the Italian Guglielmo Marconi and the Dane, Valdemar Poulson with their inventions of the telephone, phonograph, radio and mechanical recording device, discovered how to convert sound into electrical impulses and then back into sound (Sigel, 1980).

These same principles were applied in 1927 when John Logie Baird developed "Phonovision", the first, however crude, version of a videodisc system (Schubin, 1980). The next major developments in video occurred after World War II with the introduction of the video tape recorder. Video returned to a disc format in 1965 when Magnetic Video Recording provided CBS television with a magnetic disc for producing stop action and instant replay. This videodisc system continues to be the "backbone of sports coverage" (Schubin, 1980).

Two types of videodisc systems have been developed during the

1970s and first part of the 1980s. The first, or contact systems, developed by TelDec (Telefunken of Germany and Decca of Britain), JVC, and RCA, use styluses that make contact with the surface of the disc, and resemble phonograph technology as it appears during this time period. The second, or optical systems, developed by Philips, MCA, Thomson-CSF, and Sony, use laser styluses that never touch the surface of the disc, but send a beam of light that is either transmitted through or reflected off the disc to a decoding device that reads the electronic signal (Schubin, 1980). Characteristics unique to the optical videodisc system make it the only practical model to be used for educational purposes, hence any further reference in this study to videodiscs, videodisc systems or videodisc technology should be regarded as referring to this type of format.

Bennion and Schneider (1975) were among the first to move from mainframe directed video/slide presentation for individualized instruction to the world of video contained in a single videodisc system. Comparisons were immediately made between potential applications of videodisc systems and the Time-shared Interactive Computer Controlled Instructional Television (TICCIT) project of programmed instruction that they were involved with at that time. Advantages of the videodisc system over the TICCIT project according to these researchers was its greater audio capabilities, motion control, and lack of reliance on an external computer.

Schneider (1975) attempted to make a case for the cost efficiency of videodisc over other media by doing a per unit comparison. While mass production of the disc may be low in this comparison, costs for

commercial production of content for this medium have been estimated, elsewhere, at between one and three thousand dollars per minute (Kehrberg and Pollack, 1982; Hiscox, 1982; Eastwood, 1978-1979; Paris, 1981), and necessarily drives the per unit cost up. For industrial training investments of this type may not be a deterrent in the development of the videodisc, however, in education expenditures of this size are a cause for concern.

Other researchers involved with the development of programmed individualized instruction started to advocate the implementation of videodisc systems (Bork, 1978-79; Bunderson, 1979-1980; Molnar, 1979-1980). Most of the research focused on the potential for "full multimedia " (Bork, 1978-79) instructional programs on stand-alone systems, or a "dry laboratory", where students can work, or "intelligent electronic books" (Molnar, 1979-1980) for students to query. The failure to modestly appraise the potential of this technology in favor of lauding the way it so neatly fits into the programmed instruction model is evident in Bunderson's (1982) acknowledgment that researchers at the Waterford School, a prototype for this method of instruction, anticipated learner productivity to improve ten to a hundred fold after the implementation of this technology.

Paris (1981) argues that the many "myths" surrounding research of videodisc technology could create false expectations and actually inadvertently hurt its development. Rather than imagine "future" possibilities, research should focus on what the technology "can do today." Among the misconceptions, proliferated at the time of Paris'

writing, were the following ones which she attempted to debunk; videodisc will replace the book; typewritten office material is compatible with videodisc technology (The aspect ratio of typing paper and television screens are not compatible.); the Encyclopedia is readable when stored on a single videodisc; and, information can be cheaply stored on videodisc.

Hiscox (1982), also, cautioned against overstating the significance of videodiscs in education. Attempting to find a suitable method for curriculum development in the remote areas of Alaska, he considers videodiscs to have only a limited role in instructional situations. Reliability of equipment (hardware), complexity of the instructional program, difficulties in evaluating and revising disc-based programs, and costs of "interactive" videodisc systems were sited as deterrents. Implementation of videodiscs, according to Hiscox, "...suffers from severe practical limitations and is not likely to have a substantial impact on teaching methods in the next decade."

Eastwood (1978-1979) presented numerous deterrents to educational use of "intelligent videodisc" systems. Among these were the lack of faculty incentives to adapt this new technology, a lack of skilled personnel and appropriate facilities for videodiscs, a resistance to change in education, and the maintenance of the traditional role of the teacher. Amarel (1983) concurs in her study, which reveals adoption of innovation and technology into the curriculum depends "on such factors as the teachers' assessment of the quality and value of the lessons relative to their own instruction, on the amount of

disruption they were willing to tolerate, and on the firmness with which they held to their customary teaching practices."

Another problem Eastwood (1978-1979) points out is the lack of valid educational research about videodisc technology. While proclamations about potential may stir interest, the critical nature of education requires research to substantiate claims made concerning pedagogical effectiveness. Unfortunately, despite rapid growth in training applications, videodiscs have received only minimal utilization in education. As a result, what follows is a nearly exhaustive summary of research completed at this time.

The most sophisticated videodisc technology was developed by the MIT Architecture Machine Group (Backer, 1982). The program is designed to teach the fundamentals of bicycle maintenance and repair. The design incorporates diagrams, exploded views, and continuous sound.

At the other end of the spectrum is a program teaching economics to high school students in sparse areas of Minnesota. This program was designed on a shoestring budget by Kehrberg and Pollack (1982).

An area that is growing in the utilization of videodisc technology is special education (Thorkildsen and Allard, 1982; LaGow, 1979-1980). Reading programs for the hearing impaired and the mentally handicapped were the subjects of these videodisc projects.

Making use of old film footage to teach a lesson in physics limited the cost expenditure of producing the Tacoma Narrows Bridge Collapse (Zollman and Fuller, 1982).

Bunderson (1979-1980) designed a biology program for a manual

videodisc player, such as the one used in this study. The program requires students to use study skill analagous to those used to find information in a textbook.

Perhaps the most ambitious research and development was the effort of Kirchner (1982,1983), who both produced and field tested an elementary health program about the heart and circulatory system.

METHODOLOGY

The purpose of this study is to analyze the social interaction between elementary school students and videodisc systems in an educational environment. A triangulated design utilizing empirical, analytical, and critical models of data collection directs this study. The first part of the design is the observation. An interview with each of the participants follows the conclusion of the observations. The third part of the investigation is a survey of the parents and teachers of the students. Each part of the design will be treated separately in sections of this chapter.

SAMPLE POPULATION

The sample population for this study was drawn from a small midwestern urban environment of approximately 175,000 inhabitants. Most of this community consists of governmental workers that service

the university or state agencies that are centered in this city. There is some light industry, as well as some commercial enterprises in the central city and areas around the periphery of the city. School enrollment decline has tapered off, and there is discussion about reopening some schools that were closed during the decline. Presently, the school district is undergoing school "pairing" as part of a desegregation program that was initiated during the current school year. Both schools, the one that served as the site of the pilot study, and the one that served as the site of the final study, were cited by the district's human relations director as having a diverse population.

The intact groups that comprised the pilot study and final study were one third and two fourth grade classes, respectively. The pilot study will be discussed in more depth later in this chapter. There were nine girls and ten boys in one fourth grade class, and eight girls and twelve boys in the other fourth grade class. Three black and sixteen white children made up the nineteen members of the first class, and two black and eighteen white children made up the twenty members of the second class. All classes were heterogeneously grouped, and reformed to constitute homogeneous groupings during math and reading lessons. Students participated in the observed interaction with the videodisc system only in their "homeroom."

Achievement scores were not available, but reading groups ranged from nearly a year behind in the basal series to a year ahead. In one math class the investigator was present when the teacher showed a film reviewing basic multiplication and division facts, which most of the

class seemed proficient at answering, as observed by their responses to problems posed in the film and wallcharts indicating their scores on speed drills.

While a videodisc player and accompanying software have been available in the school district for the past three school years, the implementation of this technology has been nearly non-existent in the curriculum. According to the school district media director, and from other inquiries made by the investigator, the best assessment is that videodisc systems have encountered limited utilization at the secondary level and almost no utilization at the elementary level. Several reasons for this failure were given by one of the fourth grade teachers involved in the study in an informal interview. First, unlike movie and slide projectors, which are present each school, a videodisc player must be retrieved from the central administration building. Second, according to this teacher, "...you practically have to sign your life away," in order to acquire this equipment. The lack of quality software was given as the final deterrent.

PILOT STUDY

The third grade class involved in the pilot study was in a neighboring school to the school which housed the fourth grade classes involved in the final study. Eleven girls and eight boys made up the constituency of this class. Two black, two native American, one Hispanic, one Vietnamese, and thirteen white children made up the nineteen members of this class.

All the instrumentation and procedures for the observation,

interview, and survey were the same as those used in the final study. The only difference is that the raw data recorded by the SSR keyboard was not transcribed by Program PLEXYN for further analysis. The purpose of the pilot study was to develop proficiency in the use of the instruments, and to help refine the behavior categories. More information about behavior categories follows in the next section on instrumentation.

INSTRUMENTATION

The instrument for the observation was the SSR (Senders, Signals, and Receivers in Stephenson and Roberts, 1977) system keyboard for recording communication events, along with Program PLEXYN (Stephenson, 1979), a computer-compatible grammar that transcribes character strings typed in by an observer, and which permits the rapid coding of complex social interactions without the observer having to look away from the events being recorded. A program was written that allowed the investigator's Apple IIe to simulate the SSR keyboard. Each student record was stored as a separate file on a floppy disc. Files were later transferred to an IBM-DOS floppy disc for reformatting and transcription by Program PLEXYN.

The following model was devised by the researcher to enable a theoretical perspective for analyzing the complex social interactions exhibited when elementary school students interact with videodisc systems in an educational environment. First, student social interaction can be characterized as belonging in one of two large domains. Either the student accepts the educational experience, or s/he resists the educational experience. This can be further divided into four distinct states of the social system: active acceptance, passive acceptance, passive resistance, and active resistance. Each of these manifests itself through various patterns of behavior that can be distinguished from each other by their level of intensity. The following table (see Table 1) illustrates these manifestations.

TABLE 1
MANIFESTATIONS of the SOCIAL INTERACTION SYSTEM
in ELEMENTARY SCHOOLS

	LIMITED	MODERATE	EXTREME
ACTIVE ACCEPTANCE	Enthusiastic	Energetic	Exuberant
PASSIVE ACCEPTANCE	Docile	Compliant	Obedient
PASSIVE RESISTANCE	Indifferent	Nonchalant	Obstinate
ACTIVE RESISTANCE	Flippant	Disobedient	Hostile

All of the observable behaviors fit into these twelve categories.

Many of the initial behaviors in the first behavior catalogue were derived from other observational studies, and the researcher's own experience as a teacher in an elementary school classroom. For the pilot study a list of over one hundred behaviors were defined and put in the catalogue. After the pilot study more than one third of the original behavior categories were removed because they failed to appear even once, and were assessed upon reflection as being highly unlikely to occur. An additional fifteen new categories emerged during the pilot. In all, seventy-four behaviors were defined and used in the final study

Analysis of these behaviors, and placement in the correct classification in the social interaction system is dependent on not only the incidence of the behavior, but its duration, repetition, and sequence of occurence. Program PLEXYN through its fourteen defining

categories searches for errors in recording, removes redundancy in the record, turns off categories through mutual exclusion (i.e, a student cannot cut and fold paper at the same time), and permits the insertion of subjects and objects by default (i.e., slow motion has the videodisc system for its subject, while reads screen has the student for its subject and the videodisc system for its object). Through careful investigation of the data meaningful patterns emerge.

The instrumentation for the interviews and survey will be explained in the following sections.

INTERVIEWS

Interviews were conducted with seventeen of the nineteen students in the pilot, and thirty-eight of the thirty-nine students in the final study. The reason for the exclusions in all three instances was due to student absence. The original intention of the researcher was to conduct interviews following the observations to enable the line of inquiry to pertain to the particular behaviors observed. Unfortunately, in securing permission to conduct this study it was necessary to prepare any questions to be used beforehand for approval by the external research committee of the school district. The following questions (see Table 2) were asked of the students after completion of the observations.

TABLE 2: STUDENT INTERVIEW
(Interviews with students were tape recorded.)

1. What is your name? (This was done to gain rapport. Anonymity was assured.)
2. Briefly, state what you learned from working with the videodisc system.
3. What did you like about this method of learning?
4. What didn't you like about this method of learning?
5. What other things do you think could be learned using a videodisc system? Give some examples.
6. Did you feel comfortable using the videodisc system? Why (or, why not)?
7. Did you think the videodisc system was "friendly?" Why (or, why not)?
8. Did you ever think you could "talk to" or carry on a "conversation" or "dialogue" with the video program? (If so, tell why you thought this, and if there were any particular times when you thought this "conversation" occurred.)
9. Did the videodisc system seem "smart" or "intelligent?" Why (or, why not)?
10. Did you feel like you were in control of the lesson, or did the lesson seem to control you?
11. Did you ever feel nervous? Why?
12. How much computer experience have you had at school? home? elsewhere?
13. How much video experience have you had at school? home? elsewhere? Did any of this include the use of a videodisc system?
14. How often do you watch television at school? home? elsewhere?
15. Do you ever play arcade games? Where? How often?

SURVEYS

The final part of the investigation was a survey of the parents, teachers, and administrator of the students involved in the observations and interviews. Again, the intention was to derive statements from the observation and student answers to questions, however, prior approval was necessary to secure permission to conduct the survey. The following table (3) provides the statements to which parents, teachers, and administrator were asked to respond. A line with a continuum from strongly agree to strongly disagree with uncertain in the middle was provided on the distributed surveys.

TABLE 3: PARENT and EDUCATOR SURVEY

1. Students need learning experiences utilizing videodisc systems.
2. Students are less apprehensive than teachers about advancing technology.
3. Students need to learn about videodisc systems and computer technology at school.
4. School curriculum is too overloaded already to add videodisc and computer studies.
5. Software selection is as important as textbook selection.
6. Videodisc systems and computer technol ogy dehumanize schools and classrooms.
7. Students work better with machines, such as videodisc and computer systems, than they do with each other.
8. Interpersonal skills development decreases among students utilizing videodisc systems and computer technology.
9. Conversation or "dialogue" with "artificial intelligence" is possible.

PROCEDURES

Each class participating in the study took a week to complete the observational portion of the investigation. At the start of each of these weeks the class under investigation was given a presentation explaining what a videodisc system is, and how it works. Explanations are given and a demonstration of how to use the remote control device to obtain "real time," slow motion, fast motion, still frame, step frame, and reverse is illustrated. The steps for finding a new chapter on the First National Kidisc were outlined, and some of the chapters were previewed. This software was selected because of the different types of activities and various interests it provides for, as well as the opportunity to give the student control over the widest possible choice of the kind of interaction desired, while at the same time providing an instructional task to be performed. The First National Kidisc was not specifically designed for use in education, but an educational consultant was part of the production staff (Blizek, 1982).

A schedule was drawn up by the teacher and researcher assigning thirty minute periods for each child to work with the videodisc system. Periods when students were working with specialists, such as the art, music or physical education teacher, were avoided.

The videodisc system was set up at the far end of each room in learning center fashion. The learning center consisted of a desk with supplies stored inside for paper folding, knot tying, secret code chart construction, and flip books (simple animation). The 19" Zenith

color television that served as the monitor was placed at eye level in front of the desk. This was a major improvement over the pilot study which had a cart that forced the students to look up at the monitor. In both classrooms in the final study the Pioneer VP-1000 Videodisc player with the First National Kidisc already inside was placed to the students' right-hand side. In the first classroom since the desk was so large the player was set right on the desk. In the other classroom it was placed on a cart the same height as the desk.

Two charts, one with instructions reviewing the items given in the class presentation and another with the various chapters for selection from the software were at the station so the student may work independently. These were

placed flat on the large desk in the first classroom, and were held up by chart stands above the monitor and videodisc player in the other room. The remote control device was set on the desk in each classroom.

The first five minutes of each period were spent reviewing procedures presented in the original class orientation. Students were given a chance to attempt a chapter search, and to ask any questions about the procedures they might have before beginning the lesson. Once the student was ready, the video camera that was at a right angle to the student's right side was activated. The computer program was booted and the observer, who because of limited space had to sit on the same side of the student as the video camera, began to record the social interaction between the student and the videodisc system in the environment herein described.

RESULTS and CONCLUSIONS

Since this is a report on research in progress, at the time of this conference very little is known about the observation. The observation files have not gone through the transcription process of Program PLEXYN at this time. The only possible remarks regarding the observation that can be made is that the "novelty effect" is evident in that it produced excitement in some over the possibility of something different to do, and created anxiety in others because of the fear of the unfamiliar. This does not appear to say too much, but it must be realized that videodisc systems are a new technology, and nearly everywhere in education, and particularly at the elementary level this effect is going to be encountered for some time.

The minimal results currently available from a cursory examination and tabulation of responses to the interviews with students reveals no apparent differences between gender regarding attitudes and perceptions of videodisc systems. Most of the students, thirty-six of thirty-nine, or ninety-two percent claimed to be comfortable working with the videodisc system. An even higher percentage, thirty-eight of thirty-nine, or ninety-seven percent found the system "friendly." Thirty-two students, or eighty-two percent, thought the videodisc system was "smart" or "intelligent," while two thought otherwise, and four students were uncertain. Possibly the most divided response concerned whether or not a "conversation" or "dialogue" could be held with a videodisc system. Sixteen, or forty-two percent, thought this was a possibility, while eighteen, or

forty-seven percent, did not think this was possible, three, or eight percent, put forth a tentative maybe, and one, or three percent, did not know.

Biographical information gained through these interviews indicated a high incidence of television viewing ranging on the average about two hours an evening, and slightly higher viewing times on the weekend, by the students' own estimates. Ten students, or twenty-six percent had personal computers at home, and an equal number owned video tape recorders.

Finally, while the results are not complete, the evidence is clear, at least to this researcher that in studying student interaction it is necessary to expand current educational research paradigms to include social interaction analysis.

REFERENCES

Allen, R., and Allen, S. Computer-assisted videodisc: An african perspective. Performance and Instruction Journal, 1983, 22(9), 28-31.

Amarel,M. Classrooms and computers as instructional settings, Theory Into Practice, 1983, 22(4), 260-266.

Arnheim, R. Visual Thinking, Berkeley: University of California Press, 1969.

Backer, D. One-of-a-kind video programs. Instructional Innovator, 1982, 27(2), 26-28.

Bennion, J. and Schneider, E. Interactive video disc systems for education. Brigham Young University: Provo, Utah, 1975. (ERIC Document Reproduction Service No. ED 158 719).

Blizek, J. The first national kidisc--TV becomes a plaything. Creative Computing, 1982, 8(1), 196-210.

Blurton Jones, N. and Woodson, R. Describing behavior: The ethologists' perspective. In Lamb, M., Suomi, S., and Stephenson, G. (Ed.), Social Interaction Analysis: The Methodological Issues, Madison: University of Wisconsin Press, 1979.

Bork, A. Stand-alone computer systems--Our educational future. Journal of Educational Technology Systems, 1978-1979, 7(3), 201-207.

Bunderson, C., Hoekema, J., Hon, D., Wilson, L., Worcester, C., Woodward, H. Interactive video: in search of a definition. Performance and Instruction Journal, 1983, 1983, 22(9), 8-9.

Bunderson, C. Curriculum strategies. In O'Neill, H.(Ed.), Curriculum-Based Instruction, Englewood Cliffs, NJ: Prentice-Hall, 1981.

Bunderson, C. Instructional strategies for videodisc courseware: The mcgraw hill disc. Journal of Educational Technology Systems, 1979-1980, 8(3), 207-210.

Bunderson, C. Will technology improve instructional productivity? Instructional Innovator, 1982, 27(2), 29, 44.

Eastwood, L. Motivations and deterrents to educational use of "intelligent videodisc" systems. Journal of Educational Technology Systems, 1978-1979, 7(4), 303-305.

Hiscox, M. A summary of practicality and potential of videodiscs in education. Videodisc/Videotex, 1982, 2(2), 99-109.

Johnson, D. and Johnson, R. Learning Together and Alone:Cooperation, Competition, and Individualization, Englewoods Cliffs, NJ: Prentice-Hall, 1975.

Kemph, J. Videodisc comes to school. Videodisc/Videotex, 1981, 1(2), 94-97.

Kehrberg, K. and Pollack, R. Videodiscs in the classroom: An interactive economics course. Creative Computing, 1982, 8(1), 98-102.

Kirchner, G. Simon fraser university videodisc project: Part one: Design and production of an interactive videodisc for elementary school children. Videodisc/Videotex, 1982, 2(4), 275-287.

Kirchner, G. Martyn, D., and Johnson, C. Simon fraser university project: Part two: Field testing an experimental videodisc with elementary school children. Videodisc/Videotex, 1983, 3(1), 45-58.

LaGow, R. Instructional development related to an intelligent videodisc. Journal of Educational Technology Systems, 1979-1980, 8(3), 231-239.

Love, J. The videodisc: Television's new horn of plenty. Media and Methods, 1979, 15(10), 49-52.

Molnar, A. Intelligent videodisc and the learning society. Journal of Educational Technology Systems, 1979-1980, 8(1), 31-39.

Onosko, T. Vision of the future. Creative Computing, 1982, 8(1), 84-94.

Paris, J. Debunking the myths about videodisc technology, Videodisc/ Videotex, 1981, 1(2), 90-93.

Salomon, G. Interaction of Media, Cognition, and Learning, San Francisco: Jossey-Bass, 1979.

Schneider, E. Applications of videodisc technology to individualized instruction. Brigham Young University: Provo, Utah, 1975. (ERIC Document Reproduction Service No. 158 722).

Schubin, M. Videodiscs in education. In Sigel, E. Schubin, M., and Merrill, P. (Ed.), Video Discs: The Technology, The Applications, and the Future, White Plains, NY: Knowledge Industry Publications, 1980.

Sigel, E. Video Discs: The Technology, The Applications, and The Future, White Plains, NY:Knowledge Industry Publications, 1980.

Slavin. R. Student Team Learning: An Overview an Practical Guide, Washington,D.C.: National Education Association, 1983.

Stephenson, G. Plexyn: A computer-compatible grammar for coding complex social interactions. In Lamb, M., Suomi,S., and Stephenson, G. (Ed.) Social Interaction Analysis: The Methodological Issues, Madison: University of Wisconsin Press, 1979.

Stephenson, G. and Roberts, T. The ssr system 7: A general encoding system with computerized transcription. Behavioral Research Methods and Instrumentation, 1977, 9, 434-441.

Stephenson, G., Smith, D. and Roberts, T. The ssr system: an open format event recording system with computerized transcription. Behavioral Research Methods and Instrumentation, 1975, 8, 259-277.

Thorkildsen, R., and Allard, K. Microcomputer/videodisc cai--Some development considerations. Paper presented at SONY Videodisc Conference, Chicago, IL: 1982. (received by Robert Houghton, in attendance.)

Vereen, M. unpublished dissertation, University of Wisconsin-Madison, 1983.

Zollman, D. and Fuller, R. The puzzle of the tacoma narrows bridge collapse: An interactive videodi c program for physics instruction. Creative Computing, 1982, 8(10), 100-109.